

THE MILITARY FAMILY UNDERGOING SEPARATION:  
IMPACT UPON THE FAMILY AND THE  
MILITARY HEALTHCARE SYSTEM

By

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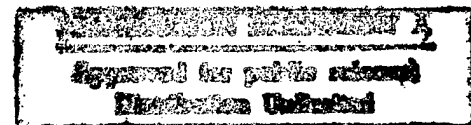
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## DEDICATION

To Karen, Kurt, Ryan, and Liesel for their patience and support throughout this year and during my deployments—those in the past and those yet to come.

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The family in the military has been subject to stressors in the past decade that are more intense in aspects never before experienced. The drawdown in military installations and personnel, particularly in overseas locations, has effected significant changes in the deployment of forces. At the same time there has been an increase in the numbers and types of operations and missions that the branches of the military are being committed to. Many of these actions require frequent and prolonged deployment of personnel from bases in the United States to remote locations worldwide.

In this descriptive study the hypothesis that families who are experiencing separation due to military deployments utilize the Military Treatment Facility (MTF) more frequently than those not experiencing deployment is investigated. Six United States Air Force bases were chosen for study, with three of the bases having prolonged squadron deployments to overseas locations during 1997. The three non-deploying bases were used for comparison, selected for their close geographical proximity to the deploying bases. MTF utilization rates were calculated based on data contained in the Ambulatory Data System (ADS).

The utilization rates for two of the base pairs follow approximately parallel trendlines. The other pair has a crossover of the trendlines during the middle of the year, at a time when a deployment is occurring. The three deploying bases actually show a decrease in utilization rates during the period of deployment.

One limitation of this study is that the ADS database cannot be queried by unit of assignment, leading to utilization rates that are inflated due to family members who are not experiencing deployment. There are a number of military members who are deployed on an individual basis, making the impact of their absence difficult to quantify. Although controlling for seasonal variation by using bases in close geographical proximity for comparison, the seasonal variation in MTF utilization is of such weight to overwhelm any perceptible variation in utilization due to deployment.

The original hypothesis of this study is supported by the extant literature. Further study is warranted, with more specific criteria, to validate this hypothesis for the contemporary military.

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## BACKGROUND

### *Statement of Public Health Problem*

The military family is a unique community subject to unique stresses unlike those found in the civilian family community. There are expectations and demands of this community that require flexibility and sacrifices beyond any measure found outside the military. The impact of these stressors on the military family can have a direct relationship on the morale of the servicemember, as well as influence their intention to remain in the military (Kohen, 1984). One significant stressor is parental absence due to short-term missions, temporary deployment, or even long-term unaccompanied remote assignment. With the continual downsizing of the military both in population and numbers of bases, the anticipation is for increased frequency and length of family separations. The military is being utilized in operations and missions previously considered to be outside the purview of the military's job description. There is variability in who undergoes separation, for how long, and how often, dependent upon the specialty of individuals and units.

The increased stress is manifested and managed by the family in various ways. Multiple measures are employed by the military infrastructure in an attempt to mediate the stress and help the family cope. Utilization of the military healthcare system is one avenue of help that is sought, sometimes overtly for the stress itself, and at other times for somatic manifestations of the stress. In an era of decreasing healthcare dollars and personnel, it is important to examine the scope and degree of this utilization. If there is over-utilization due to the stress of family separation, proactive and preventive measures to avert this pattern of use should be adopted in order to ensure healthcare resources are utilized wisely and

efficiently. An additional benefit should be enhanced morale and retention potential for the servicemember and his or her family.

### *Literature Review*

A number of studies in the military services other than the Air Force have been undertaken to validate and assess the relationship between absence of the military parent and effect upon the family. Wives of nuclear submarine personnel were noted to have significantly higher depression scores on both the Zung Depression Scale and the Multiple Affect Adjective Checklist during husband-absence (Beckman, 1979). Nice (1983) corroborated this finding utilizing the Depression scale of the 40-item Mood Questionnaire over the course of deployment separation in another group of Navy wives. He also noted that age was the best predictor of depressive affect among separated wives, with younger wives experiencing higher levels of depressive affect than did the older wives. This submariners' wives syndrome typically occurred just before or after the return of the deployed spouse and was primarily due to "unacceptable rage over the desertion" (Isay, 1968). Another study found that wives experiencing psychiatric disturbances while separated from their husbands for military reasons were usually younger and less educated than wives with psychiatric disturbances but not separated (Macintosh, 1968). The limiting factor in the validity of most of these studies is that they typically consisted of only 20-40 total study participants. As well, their generalizability is questionable since they looked at Navy submariners' wives exclusively.

The literature is less consistent when examining the effect of separation on children. In general, the child's emotional development determines outcome with underlying psychopathology a significant factor (Amen, 1988). A survey of 1,601 children of soldiers deployed during Operation Desert Storm (ODS) found the strongest predictor of children receiving counseling during ODS was a previous history of being in counseling for emotional problems (Rosen, 1993). One author even hypothesized that separation from the father is a "developmental interference" that results in a disturbance of the typical unfolding of the child's personality, specifically superego formation, the capacity to tolerate object loss, and object relations (Crumley, 1973). Hillenbrand (1976) performed a study of 73 boys and 53 girls in the 6<sup>th</sup> grade of a United States Marine Corps Department of Defense school using teacher, student, and parent assessment instruments to examine intelligence, classroom behavior, parental dominance, parental identification, and family constellation. For first-born boys, cumulative father absence showed a positive correlation to enhanced quantitative ability and perception of the mother as the dominant parent. For eldest girls, there was an association between high perceived maternal dominance and less aggressiveness in the classroom. Those boys with older siblings and who began to experience absence in the first five years of life showed increased aggression and dependency. For girls who were not first-born, paternal absence was related to decreased quantitative ability.

One link noted was that the development of pathology in children was usually related to the response of the mother to the father's absence (Jensen, 1989). In a cohort study of 383 children divided into two groups based upon whether they had a parent deployed in ODS, deployment itself rarely provoked pathological levels of symptoms in otherwise healthy

children, although the children of deployed personnel experienced elevated self-reported symptom levels of depression, as did their parents (Jensen, 1996). These findings were summarized by Shaw (1987), "The specific reaction to father absence is determined by the child's gender, stage of development, the length of father absence, the capacity of the mother to expand her parental role, the quality of the relationship with the father and the availability of male surrogates."

There are several studies that translate these effects on the family undergoing separation to an increased utilization of healthcare services, as well as other support mechanisms. One study showed that separation from the husband causes a significant increase in health care visits by the mothers of young children but does not appear to affect the number or type of pediatric visits made (Abbe, 1986). Conversely, a cross-sectional analysis of 512 civilian families with children under age 18 examined the relationship between family stress, illness, and the use of health services and showed over-utilization for children while mothers actually showed under-utilization (Roghamann, 1972). Another study of 48 Navy submariners' wives found results suggesting that physical illnesses and complaints were related to the husbands' work cycle and were significantly more frequent during periods of separation. The author states that doctors and hospital staff consistently argued that women whose husbands were at sea were seen more frequently in their clinics (Snyder, 1978). A survey at an Army pediatric clinic obtained results from 258 of 500 questionnaires given to parents accompanying their children. At least 120 families had experienced a non-accompanied tour of duty and 66 of these families reported a problem with at least one child during paternal separation. One finding was that readjustment

problems were sometimes more severe and long-lasting than problems during separation (Yeatman, 1981).

While most wives rely on their network of family and friends for some support during deployments, they are also more likely to bring family-related problems to military health and social services (Kohen, 1984). One assertion is that the more the family can expect and receive help from peer families and relatives, the more "primary and derivative problems it can avoid," with less need for formal resources (Montalvo, 1976). Nice (1993) asserts, "The point of greatest intersection between the family and the military is the health care system." He continues, "The provision of medical care for military dependents has been largely reactive." The belief is that those military policies that strengthen and support the family may have direct implications for the health and readiness of the active-duty force. He goes on to make the connections between separation and stress, the subsequent increased use of health services, and that it is usually a small proportion of families who account for a disproportionately large share of health care utilization. He recommends strong consideration be given to priority admittance to family practice programs for those families anticipating deployment separation.

#### *Summary of the Pertinent Literature*

The evidence to date tends to confirm that increased stress due to deployment separation leads to increased utilization of health care resources by military families. There is a paucity of information on the existence of such a relationship within the Air Force. Further study is suggested with regard to Air Force Medical Treatment Facilities to see if

episodes of deployment separation lead to increased utilization by dependents. Were such a relationship borne out by the data, the next step would be to devise and implement strategies to approach separation from a preventive aspect in an effort to avert the demand for intervention and the strain upon the family and the health care system that separation invokes.

## PURPOSE OF THIS STUDY

This study will compare utilization of the medical treatment facility by family members at Air Force bases with deployed units and personnel versus utilization at bases without significant deployments. Specifically, the question to be answered is whether family separation due to deployment results in increased utilization of the military medical treatment facility by family members. The null hypothesis for this study is that there is no measurable difference in utilization of the medical treatment facility by family members when there is separation due to deployment versus when there is no deployment. If the alternate hypothesis is supported, this may serve as an indicator of increased stress being experienced by the families and the base population as a whole during unit deployments. Further study can then be done to evaluate the reasons for these visits so that interventions can be targeted at the needs of these families, with the ultimate goal of reducing this stress for both the families and the medical treatment facility.



## METHODS AND PROCEDURES

### *Study Population*

The population at risk is that of all Air Force families worldwide during 1997. Although military personnel in jobs such as staff headquarters are unlikely to deploy, the mobility nature of the Air Force in 1997 is such that all personnel are subject to deployment if the need arises, much as occurred in Operation Desert Shield / Desert Storm.

### *Sample Population*

For this study, six bases were chosen for evaluation with respect to the hypothesis (Figure 1). Three of the bases experienced long-term deployments (greater than 30 days duration) in 1997. The other three did not experience deployments and serve as a baseline for comparison of medical treatment facility utilization.

McConnell Air Force Base, Kansas is the home of the 22d Air Refueling Wing, comprised of the 344<sup>th</sup>, 349<sup>th</sup>, 350<sup>th</sup>, and 384<sup>th</sup> Air Refueling Squadrons. They fly the KC-135 Stratotanker which has a 4-person crew. During the period of May through August 1997, 24 crews from McConnell were deployed (12 crews for 45 days each). The second base evaluated is Hill Air Force Base, Utah, home of the 388<sup>th</sup> Fighter Wing, comprised of the 4<sup>th</sup>, 34<sup>th</sup>, and 421<sup>st</sup> Fighter Squadrons. During the period of September through December 1997, each of the squadrons was deployed for 45 days at a time, in successive rotation. The third base evaluated is Robins Air Force Base, Georgia, home of the 19<sup>th</sup> Air Refueling

Group. They also fly the KC-135 Stratotanker. During the period of April through June 1997, approximately 24 crews were deployed (12 crews for 45 days each).

The three bases that were used for comparison were Columbus AFB, Mississippi, Vance AFB, Oklahoma, and FE Warren AFB, Wyoming. The first two bases are undergraduate pilot training bases at which several classes a year of pilot trainees spend approximately one year in flight training. The instructor cadre and support personnel are stationed at these bases for an average of 3 years. FE Warren is a missile base with no long-term deployments.

**Figure 1 - USAF Bases Chosen For Study**



One confounding factor inherent in comparing the MTF utilization rates at the chosen bases would be the effect of seasonality in the variation of rates. Specifically, one would expect to see differences in utilization at bases which have an earlier onset of winter weather and the attendant "cold and flu" season. Therefore, the bases were chosen so as to minimize the seasonality effect by comparing bases within the same general geographic region. The comparison was made between Columbus and Robins, Vance and McConnell, and FE Warren and Hill.

There are other potential confounding factors to consider. These would include such factors as age of the family members, size of the family, and duration of the military member's career. These have not been controlled for in this study. However, they are not considered to be of significant difference between the pairs of bases that they would have a significant impact upon the results of the study.

Most of the family members of personnel in the flying squadrons at these six bases are seen in the Flight Medicine Clinic by a flight surgeon or other healthcare practitioner (Ob-Gyn or Pediatric Nurse Practitioner, or Physicians Assistant). A few patients may be seen in the Family Practice or Urgent Care Clinic. A very small number may opt to be seen off-base by a civilian provider.

#### *Source of Data*

All outpatient visits to an Air Force medical treatment facility (MTF) are documented in the Ambulatory Data System (ADS). This is accomplished through the coding of a computer dot-sheet by the medical provider at the time of the visit or soon after.

Demographic data are transferred to the ADS form from the database of the Composite Health Care System (CHCS). The dot-sheet has sections for entry of diagnoses, procedures, and extent of visit. Each facility forwards a monthly report to a central data collection center. The datasets extracted for this study were obtained from the Patient Administration Division of the Office of the USAF Surgeon General at Brooks AFB, Texas. This office serves as a central repository for Air Force MTF utilization data which are input and analyzed for the AF Surgeon General's use. The ADS data can also be used to generate reports so MTF commanders can benchmark their facilities performance against other facilities within DoD.

The obtained ADS data enumerated daily outpatient visits, by family member categories, to the Flight Medicine, Family Practice, Urgent Care, and Pediatric clinics in the MTFs at McConnell, Hill, Robins, Columbus, Vance, and Warren for 1997. The data has no personal identifier information.

### *Statistical Analysis*

The ADS datasets were received in an ASCII text file arranged in column format. After minor format changes, it was imported into Microsoft Access for creation of a database. The database was then exported into Microsoft Excel as a spreadsheet format to facilitate statistical analysis.

The MTF daily family member patient visit counts were aggregated into monthly totals for each of the six bases. In order to establish utilization rates for comparison between bases by month, a denominator for dependent population at each base was needed. The Air Force does not have a centralized database that tabulates dependent populations by base. However,

the Air Force Personnel Center does have an interactive demographic database that tabulates number of personnel by grade at each base. It also tabulates how many of these personnel have dependents in their household, but not number of actual dependents. Rank tends to have a rough correlation with age. Going from Airman Basic to Chief Master Sergeant the age range is from 18 to 50 years old, on average. Going from Second Lieutenant to Colonel the age range is from 22 to 45 years old, on average. Typically, those Airman Basics and Second Lieutenants with dependents would have one per household, on average. The increase in size of household by rank would also show a rough correlation, with Captains and Majors having three and four dependents, respectively. Likewise, the mid-level enlisted ranks would have more dependents in their household, with three or four on average. The senior ranks—Chief Master Sergeant and Colonel—typically will have only one or two dependents at home who are still eligible for medical care at the MTF. Rather than applying a factor for dependents for each rank, an approximation was achieved by using the factor of three dependents per household for enlisted members, two dependents per household for officer members. Therefore, by applying a standard factor for number of dependents to each rank, a reasonable estimate was obtained for total number of dependents at each base (Table 1). While there may seem to be many assumptions in arriving at these multipliers, the important point is that they are applied equally for each of the bases in the study, providing a standard method of obtaining a meaningful denominator for total number of dependents at each base.

The MTF utilization rates for each month were formed using the ADS monthly accumulated data as the numerator and the denominator that was derived as described above.

These rates were then charted graphically. The comparison bases were each placed on the same chart, facilitating direct comparison of the trends of utilization between bases.

**Table 1 - Total Active-Duty Dependents By Base**

	Columbus	Robins	Vance	McConnell	Hill	Warren
Enlisted <sub>R</sub>	422	2291	234	1271	2184	1584
Officer <sub>R</sub>	410	620	362	294	423	364
Enlisted <sub>A</sub>	1266	6873	702	3813	6552	4752
Officer <sub>A</sub>	820	1240	724	588	846	728
Total <sub>A</sub>	2086	8113	1426	4401	7398	5480

R = Raw number with dependents in household

A = Adjusted by factor of 3 for Enlisted, 2 for Officer

Source: <http://www.afpc.af.mil/sas/demographics/default.html>

The null hypothesis is that there was no significant difference in the visit rates for base pairs during corresponding time periods. The alternate hypothesis is that there was a difference, with the bases experiencing deployments having higher utilization rates than the bases not having deployments.

The use of utilization rates as the surrogate for stress due to deployments has limitation with regard to its use in statistical testing. In order to employ parametric statistical testing for significance or confidence intervals, the observations in the sample must meet the test for independence. However, visits to the medical facility are not independent observations due to the tendency for more people to be seen during periods of illness outbreaks and other seasonal factors, such as the spring allergy season and the winter "cold and flu" season.

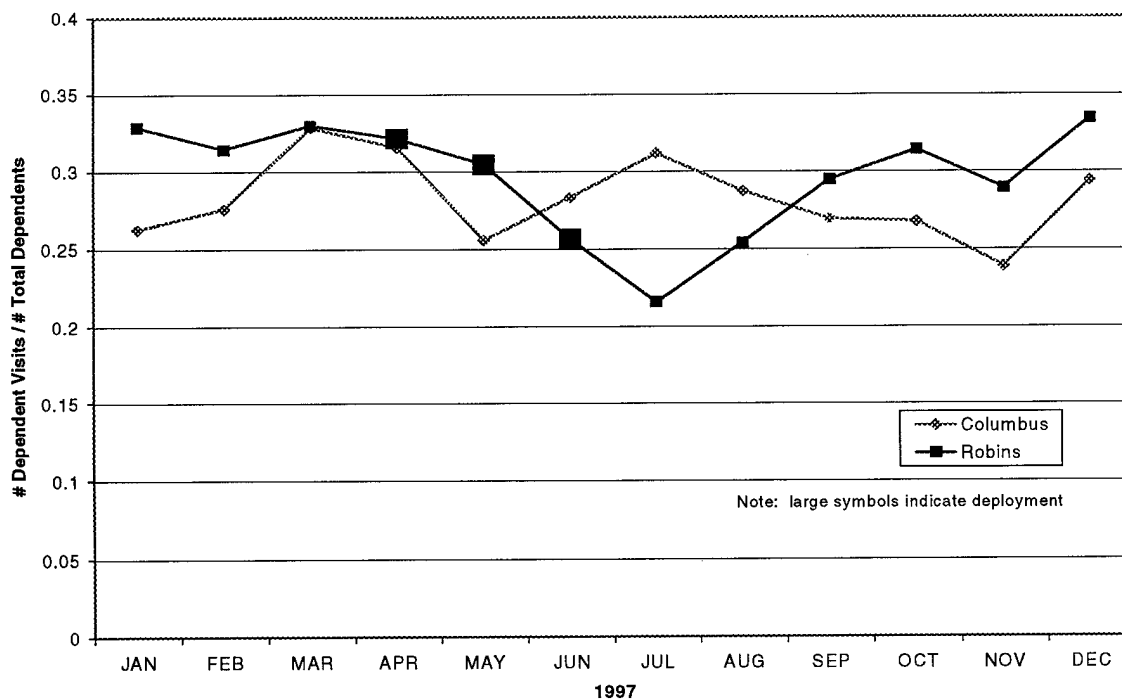
Therefore, the analyses for this study can only be done descriptively for correlation between MTF utilization rates and a deployment.

## RESULTS

The literature review and clinical experience would lead one to expect that there would be a statistically significant difference in the rates of visits during those time periods when a deployment was occurring. Only with statistical analysis would it be apparent whether the difference is significant at the chosen alpha. Comparisons could be made between each of the bases with deployments and each of the bases without deployments. The limitation of the ADS data is that it does not represent independent observations. Therefore, it does not lend itself to performing any valid statistical analysis.

The comparison plots of MTF visit rates for Columbus and Robins lead to some interesting observations (Figure 2). When looking at Columbus as the baseline, there does not appear to be easily explainable variations in the trendline. While there is an increase in

Figure 2 - Columbus AFB & Robins AFB MTF Visit Rates

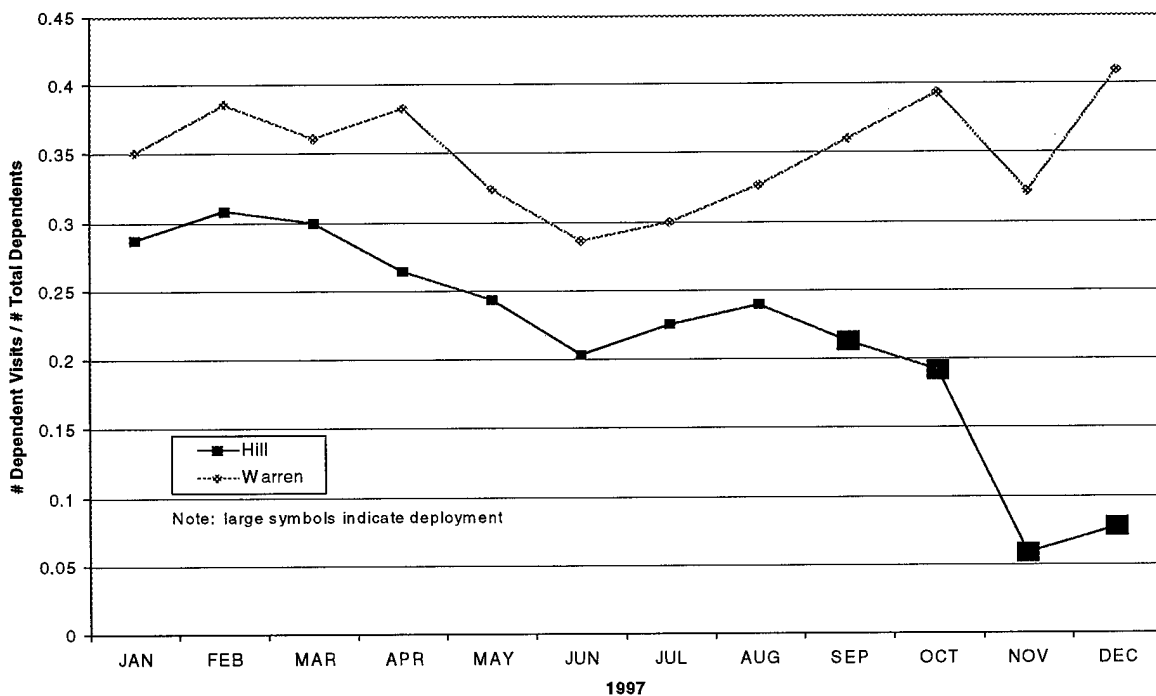




the spring that might represent an increase due to allergies, there is only a slight increase in the trendline for Robins during the corresponding time period. There is then a moderate increase in the trendline for Columbus during the summer months, a time when visit rates historically decrease. The trendline for Robins does show a decrease during the summer months. However, this is actually supportive of the alternate hypothesis since it is during this time period that the base is experiencing its largest deployment of the year. Both bases do show the characteristic increase in visits in the fall and winter months as more people are seen for acute illnesses.

The chart comparing Hill and Warren has some very interesting characteristics (Figure 3). The trendlines start off the year in parallel. They continue this way until August when

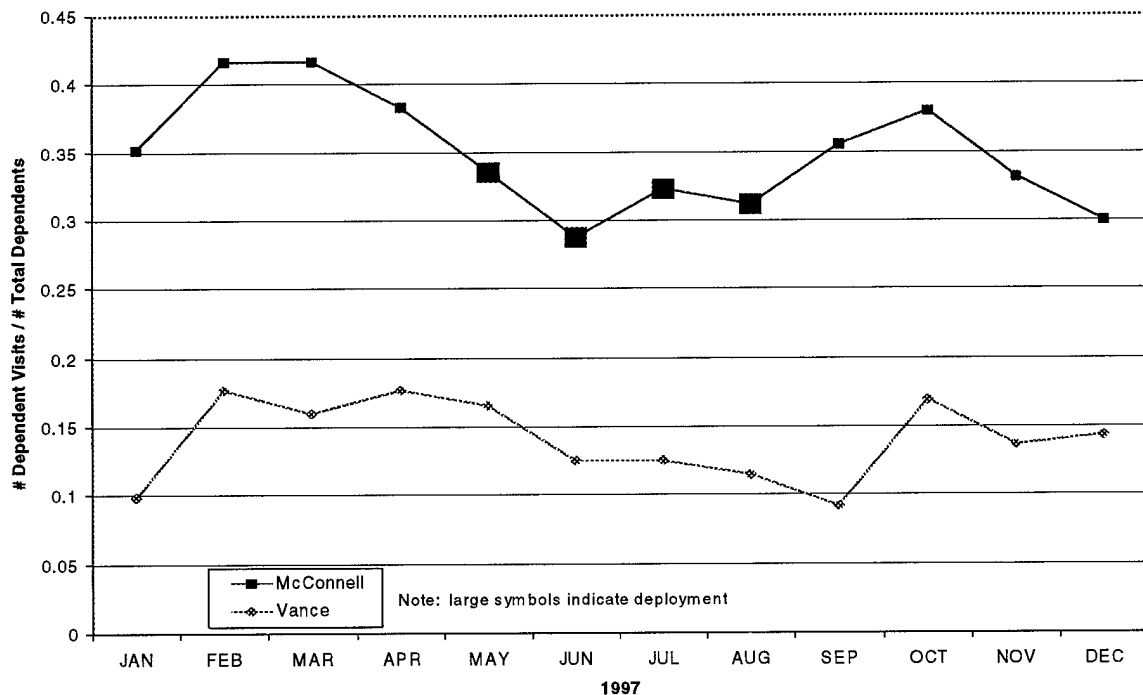
**Figure 3 - Hill AFB & FE Warren AFB MTF Visit Rates**



there is a sharp divergence in the trendline for Hill. Paradoxically, this is when the major unit deployment at Hill begins, continuing through until December. The drop in visit rates in November and December is partly due to absence of data, or none reported, for the period of 24 November to 12 December 1997.

The McConnell-Vance chart displays similar characteristics to that of the Hill-Warren chart (Figure 4). First, there is a parallel trend to the lines depicting the visit rates. However, for these bases there is a much more significant difference in magnitude between the lines—as much as three times more in the rate for McConnell than at Vance. As well, there is the paradoxical decrease in the rate for McConnell when the major deployment is occurring.

**Figure 4 - McConnell AFB & Vance AFB MTF Visit Rates**



## DISCUSSION

Although this study is not sophisticated in its structure, we would have anticipated that there would be a statistically significant difference for the groups for the study time periods. This study design would provide some evidence for a temporal relationship between the deployment and MTF usage. Its historical design leads to low cost to perform the study. While this study lends to validity by showing an association, albeit paradoxical, its generalizability is limited since it only applies to the populations at the chosen bases. These bases were chosen because they are considered representative of the bases in the Air Force that are experiencing regular unit-sized deployments for extended periods of time. McConnell is in the Air Mobility Command, the command responsible for airlift of troops, supplies, and fuel. The four-person crew on the tanker aircraft requires a proportionately larger number of support personnel to deploy in order to provide the necessary services. Hill is in Air Combat Command, the command responsible for the fighters and bombers—the fighting forces. The single-person crew of these aircraft does not require the level of support of other units.

There are a significant number of Air Force personnel who are deployed individually or as a small group or unit. Probably every base in the Air Force has at least one person who is deployed in this manner at some time during the year. However, it would not be possible to measure a perceivable impact on the MTF due to deployments of this nature.

The charts for FE Warren-Hill and Vance-McConnell raise an interesting question. Why would there be a 20 to 25 percent difference in visit rates between these two bases? The most likely explanation would be that there is a reporting difference between the two

bases—reporting bias of one base compared to the other. From practical experience, it is known that there can be wide variability in the compliance of completing the ADS data forms. This variability can be on a daily, weekly, or monthly basis. As such, it can have a significant effect on the data collected from one MTF to another. It would then have significant influence on the data drawn from ADS and its subsequent interpretation.

There are other factors that would have to be considered in explaining any observed association or lack of association. The statistical test would yield a p-value that would help in ruling-out or in the possibility of chance as an alternate explanation. There is the possibility of collection bias in that the ADS data is only as good as what the provider inputs at the clinic at the time of the visit. There should be a small number of visits that do not receive ADS coding. This should not have significant impact on the outcome of the analysis. However, this may not be the case, especially as the ADS process was in its infancy during this time period. One limitation of this study is that the ADS database cannot be queried by unit of assignment, leading to utilization rates that are significantly inflated due to inclusion of family members being seen who are not experiencing deployment.

One confounding factor that could explain an observed difference in the visit rates would be an underlying seasonal variation. This would be minimized through the use of the bases without deployments for baseline comparison. As the ADS system was only beginning to be utilized Air Force-wide in 1996, and many visits were not being recorded in ADS, use of 1996 data as a comparison for control would not be reliable to minimize the factor of seasonal variation. Some patients may be seen off-base if they have private insurance, or have not chosen TRICARE Prime (essentially limiting them to on-base for primary care).

For purposes of this study, it is reasonable to assume that their status would not change over the time frame of this study since election of treatment option is made on an annual basis. While an attempt has been made to reduce the likelihood of these alternate explanations, it is difficult to control for all of them in a study of this design and nature.

## CONCLUSIONS AND RECOMMENDATIONS

Prior studies have shown an association between family separation due to deployment and an increased rate of utilization of the medical treatment facility. However, these studies were conducted in populations other than Air Force families. This study could serve as a pilot study, leading to further study with more specific variables. If a measurable relationship were to exist, the next step could be a study evaluating the reasons these families are coming to the MTF more often during deployment separation. A further study could involve a survey of these families to better understand the stresses these families are experiencing and how to better assist them in coping during these separations.

By showing this association to hold true for the Air Force, I would hope to provide impetus for development of strategies to circumvent the over-utilization of MTFs when families are undergoing deployment separation. The next proximate goal would be to assist these families in finding appropriate and healthy ways of coping with the stresses due to separation. Ultimately, this would benefit not only the family, but the Air Force as well. The enhanced well being of the military member, particularly in an era of increased deployment tempo, should enhance retention and effectiveness of the member in carrying out the mission.

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## VITA

Wayne Keith Sumpter was born in Tampa, Florida, on November 6, 1961, the son of Ronald Keith Sumpter and Gloria Jean Sumpter. Growing up in an Air Force family, he lived in Colorado, North Carolina, Florida, England, Alabama, and Texas. After graduating from George Washington Carver High School, Montgomery, Alabama, in 1979, he entered the United States Air Force Academy. He was a Distinguished Graduate with a Bachelor of Science in Biology from there on June 1, 1983. He then entered the Uniformed Services University of the Health Sciences, Bethesda, Maryland. He earned the degree of Medical Doctor on May 16, 1987. On July 1, 1987, he began a three-year Family Practice Residency at David Grant United States Air Force Medical Center, Travis Air Force Base, California. Upon completing this residency on June 30, 1990, he was assigned to the 36<sup>th</sup> Medical Squadron at Geilenkirchen NATO AB, Germany as a Family Practice physician. He completed the United States Air Force Aerospace Medicine Primary Course in November, 1991. He was reassigned to Charleston Air Force Base, South Carolina, where he served in the 437<sup>th</sup> Medical Group as a Flight Surgeon from July 1994 to July 1997. In August 1997, he entered Phase I of his Residency in Aerospace Medicine. In June 1986, he married Karen E. Zimmerman, another Air Force brat. They are raising three Air Force brats of their own—Kurt Wayne Keith, Ryan Benjamin Wayne, and Liesel Amanda Joy.

This thesis was typed by Wayne K. Sumpter.